February 24, 2020

The city of Kyle, Texas is developing plans to expand the width of Old Stage Coach Road. There is a 51- inch diameter Live Oak (Quercus fusiformis) that is within 6 inches of the existing road. It currently restricts traffic flow with south bound traffic having to yield to north bound traffic at the pinch point caused by this Live Oak. Leon Barba, City Engineer of Kyle, requested an assessment of the current condition of this Live Oak, an assessment of its potential to tolerate the planned expansion of the road, and an assessment of the amount of soil and space the tree would need to survive the construction and continue to be an asset to the community.

There are several ways to determine condition. I used three different methods so we could get a comparison. The International Society of Arboriculture (ISA) has a Best Management Practices for Managing Trees During Construction. Its general conservation suitability worksheet considers seven categories of the existing tree to provide guidance on the tree's suitability for surviving and remaining relatively healthy after construction. Of a total possible score of 100, the 51-inch Live Oak received a score of 56. Any score below 59 is considered a tree that generally would not be a candidate for preservation. There is room for an arborist's judgement to override this score, however I am in agreement. In addition, a low score in the category of Root Cut/Fill Distance From Trunk, states that if the distance is less than a certain amount that this tree would not be a candidate for preservation based on this one category alone. This tree's rating in this category was one out of a possible score of 15. The rating for this tree using this method is that it is not a candidate for preservation. This tree would be expected to decline after construction regardless of any management provided to the tree.

Secondly, there is a condition rating used for tree appraisal. It considers 5 areas of the tree and has a rating of 1 to 4 in each category for health and structure. Condition is stated as a percentage. Using this method, no tree can have a rating below 25%. This tree rated a 50% condition rating with a low rating in root structure and health. According to this rating system, the tree's condition is poor.

The last method used involves Tree Risk Assessment. It is an intense method considering many things including likelihood of failure of the tree or parts of the tree, likelihood of impacting a target, and consequences of that failure. The current risk rating of this tree was moderate risk. That rating would change after the proposed construction to a rating between high risk and extreme risk.

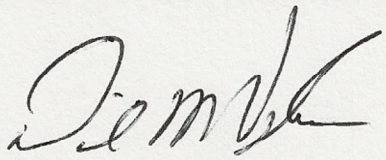
A general guide line is there should be no tree roots cut within 5X the trunk diameter of a mature tree. For this 51-inch Live Oak, that would be no roots cut within 225 inches or about 19 feet, measured from the center of the trunk. We expect more than 95% of the root system of this tree to be within 12 inches of the soil surface. Any cut or digging that goes 12 inches deep or more will remove all of the roots of this tree at the cut edge. The 19 feet restriction leaves enough root system to keep the tree standing. Cutting closer than 19 feet reduces the stability of the tree, increasing risk of failure into the high to extreme rating.

Crowngall, a bacterial disease, is present in the two groups of Live Oaks just north of the 51-inch Live Oak. An infected tree is within about 50 feet of the 51-inch Live Oak. In my experience, Crowngall does not kill mature Live Oaks. It is a stress. It can be moved by trenching or digging equipment by moving contaminated soil to a freshly cut root. If you decide to keep the 51-inch Live Oak you will need to be careful about infecting this tree with Crowngall.

There is a guideline for the amount of soil volume required to keep a mature tree healthy, based on trunk diameter of the tree. A 51-inch tree needs 3,200 cubic feet of soil, more as it gets larger. You can expect all of the roots of this tree to be in the top 12 inches of soil. To keep it healthy, your construction design will need to provide 3200 cubic feet of soil considering only the top 12 inches.

Two large limbs will need to be removed on the east side of the Live Oak to provide enough clearance over the new section of the street. In the tree's current condition, it should tolerate the removal of that percentage of its canopy. It will be less tolerant if part of its root system is removed during construction of the improved road.

In my opinion, the 51-inch Live Oak is a poor candidate for preservation.



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